

# THE SENTINEL



OFFICIAL SAFETY NEWSLETTER OF CIVIL AIR PATROL

## Controlled Flight Into Terrain

Last month, a British Aerospace Jetstream 32 twin-engine turboprop airplane, operating as a commuter affiliate for American Airlines, crashed during a night instrument approach to the Kirksville Regional Airport in Kirksville, Missouri. There were no distress calls. Weather that night included a ceiling of 300' overcast, fog and drizzle. During the approach, the airplane reportedly descended into trees, which ripped one of the wings off. The Jetstream crashed about 3 miles from the runway and burned, resulting in the death of thirteen people and serious injuries to two survivors.

The NTSB is currently investigating, so we don't yet know for sure what happened but, one of the possibilities is controlled flight into terrain - commonly referred to as CFIT.

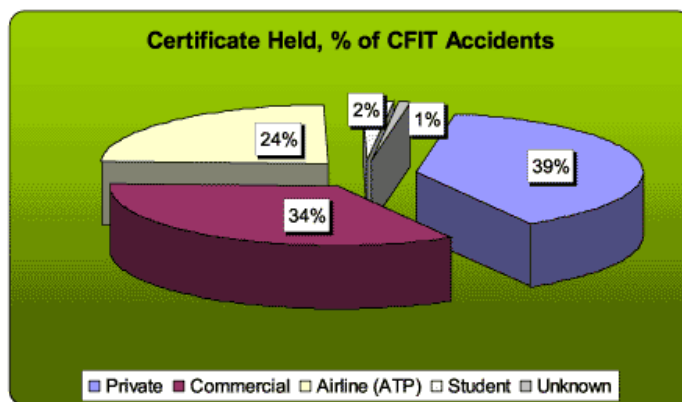
**- What is CFIT?** CFIT occurs when an airworthy aircraft under the control of a pilot is inadvertently flown into terrain, water, or an obstacle with inadequate awareness on the part of the pilot of the impending disaster.

**- Who's most at risk?** While the accident above was a part 135 Commercial operation, 81% of CFIT accidents occur in part 91 General Aviation operations. Here are some more CFIT facts:

- CFIT comprises 4.7% of all GA accidents and 32% of GA accidents in IMC
- On average there are 1.4 fatalities per CFIT accident, versus 0.33 fatalities per GA accident overall
- 17% of all GA fatalities are due to CFIT
- CFIT accidents are fatal 58% of the time.
- CFIT accidents occur 64% of the time in day-time and 36% at night

**- Does the type of aircraft matter?** Yes. Single engine aircraft are more often involved in a CFIT

accident (70%). Why is this? One reason is the general lack of Terrain Awareness and Warning Systems (TAWS) and Ground Proximity Warning Systems (GPWS) in smaller aircraft. Also, pilots of larger aircraft typically have more instrument experience. But, this doesn't mean pilots with more advanced certificates don't have their fair share, as you see below.



**- What types of errors contribute to a CFIT?**

- 50% are Decision Errors
- 30% are Skill-based Errors
- 20% are Perceptual Errors

**- Can CFIT be prevented?** Yes. The key is situational awareness. Whether you use a GPS or a chart, **know where you are all the time!**

## Black Ice

Glaze ice, commonly known as "black ice", contributes to tens of thousands of automobile accidents, and associated deaths and injuries, every year throughout the United States. It is considered to be the most significant wintertime danger to transportation.

Black ice is a thin formation of ice that occurs when water freezes on a road surface. Because it is so thin and clear, the dark underlying



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road surface easily shows through, lending to its common name.

Freezing rain and drizzle can result in black ice and is usually predictable. People generally know to avoid driving in these conditions. But, black ice can also be more insidious by forming on days that have been free of precipitation. Often after a sunny winter day, melted snow that has trickled across roadways will re-freeze into patches of ice once the sun goes down. This is especially true where roads are shaded by extensive tree cover or behind the shadow of a hill. As heat radiates into space on a cold winter night, the air just above the road will cool, and eventually reach its dew point temperature. When the temperature reaches the dew point in those few inches above the road surface, the air can no longer hold moisture and any water vapor will be forced to condense out. This will cause a layer of fine water drops to be deposited on the road surface. Because the road is below freezing, these drops will freeze to form a thin layer of clear, hard ice. Black ice can form at any temperature at or below freezing, but it is favored to form when the road surface is between 25°F and 32°F. Anytime you are driving on a night with fog and a temperature around or below 32 F, anticipate areas of black ice.

In most cases, black ice is hard to predict and is very hard to observe until it is encountered. By then it is too late to react. The best defense against running into black ice is to practice good winter driving skills, and be aware of the temperature, time of day and other weather conditions. Pay close attention to any changes in color or reflectivity of a road surface. Generally, it's a good idea to slow down and be ready for possible icy roads anytime the air temperature is below freezing and the roads are wet. Because cold air can circulate around bridges and overpasses, they freeze first and may have black ice on them. If you see a patch of black ice before you reach it, try to slow down as you approach, but never brake on the ice - this will put your car into a skid. Try to coast through the area. Four wheel or all wheel drive won't provide any additional traction benefit on ice, so don't count on it. Your knowledge and preparation can save the lives of you, your family and other motorists.

## Obstacle/Confidence Course Safety

The obstacle course predates the confidence course and its origins are lost in antiquity. The confidence course however, was originally conceived, built, and used to train the British Royal Commandos starting in 1946 - and today, CAP cadets also participate. Since 1999, CAP has experienced 15 injuries on these courses - 9 have been serious - several have resulted in litigation. The vast majority of these serious mishaps are from falling and a lot of these injuries are preventable by adding safety to the picture.

Make no mistake about the hazards involved - even the Marines label these courses as high-risk activities. How do we make these activities as safe as possible for CAP participants? Maybe we should consider some of the techniques used by the United States Marine Corps to protect their troops:

- Participants should be physically fit
- Participants should undergo two weeks of conditioning exercises prior to the course
- Conduct warm-up/stretching exercises for all participants prior to starting
- During warm weather, make sure there is plenty of water and that all participants remain well-hydrated
- Have trained instructors from the course facility and a student to instructor ratio of 10:1
- Have an instructor explain and demonstrate the proper techniques for each obstacle
- Assign a course facility instructor to any obstacle requiring high climbs
- Ensure that the course is inspected by a course instructor on the day of the event
- Landing areas should have at least 24" of uncompressed wood mulch and be loosened-up often during the course
- Adverse weather increases the hazards on the course - take this into account before proceeding
- Have two separate means of communicating with a hospital and a fire department - know their phone numbers prior to the start of the course event
- Have a qualified Emergency Medical Technician (EMT) with an emergency vehicle on site that is equipped with a first aid kit, backboard, oxygen, splints and neck brace

### Other Safety Meeting Topics

- **Aircraft Icing:** <http://www.aopa.org/asf/publications/sa11.pdf>
- **Winter Car Safety:** <http://www.safety.com/automotive/>
- **Hypothermia:** <http://www.hypothermia.org/>

**No Safety - Know Pain**

**Know Safety - No Pain**